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(54) SYSTEM AND METHOD FOR CHARGING ARTICLE OF CONSUMPTION, AND PROGRAM FOR THE SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a system for charging an article of consumption in which a user can pay a charge for the use of the article of consumption according to an amount consumed and a useless expense concerning the purchase of the article of consumption can be eliminated.

SOLUTION: Users 1007 and 1008 connects a printer 1004 to a wide area communication network directly or indirectly through a PC 1003, and access a cartridge accounting center 1001, and pay a charge according to the scheduled number of sheets for use. The cartridge accounting center 1001 accesses the printer 1004 of the users 1007 and 1008, collects use information and charging information in the memory 1005 of a cartridge 1006, and updates the accounting information according to an amount paid. When a print is requested by the users 1007 and 1008, the printer 1004 obtains the use information and the accounting information in the memory 1005, and carries out the print in a available range.
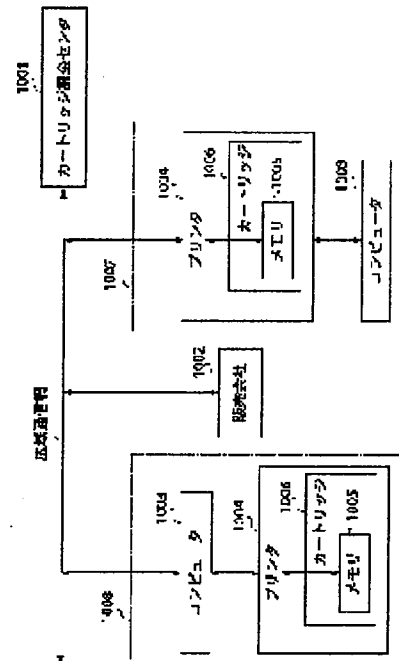
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DETAILED DESCRIPTION
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[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the accounting system, charging method, and
program of the consumable goods which charge the consumable goods of an image forming
device.
[0002]
[Description of the Prior Art]Now, in the accounting system of the cartridge containing the toner
or toner, and photoconductive drum of an image forming device, the way a user purchases a
cartridge from a sales company is taken.
[0003]If it explains using drawing 11, from the sales company 1002, a user will purchase the
cartridge 1006 in exchange for a price, and will use it, equipping the printer 1004. The
cartridges 1006 after use are collected by the sales company 1002, or are discarded by the
user.
[0004]
[Problem(s) to be Solved by the Invention]However, in the conventional accounting system
mentioned above, when there is no schedule to which a user needs to purchase a cartridge
beforehand and prints it in large quantities irrespective of the amount of the schedule used, a
user will be burdened with useless expenses.
[0005]Since disposal of the cartridge after use is left to a user's judgment, in spite of being
recyclable, it is difficult for a maker to collect cartridges certainly.
[0006]A user can make payment of the utilization charge of the consumable goods according
to utilization quantity, and the purpose of this invention has him in providing the accounting
system of the consumable goods which can lose the useless expenses concerning the
purchase of consumable goods, a charging method, and a program.
[0007]

[Means for Solving the Problem]This invention is [the invention according to claim 1] characterized by that an accounting system of consumable goods used with an image forming device comprises the following.

An accounting information setting-out means to set up accounting information of said consumable goods according to the amount of money paid by user.

A use information setting means to set up use information which changes with said user's use. The amount-used limit means which restricts the amount of said user used based on said set-up accounting information and said set-up use information.

[0008]The invention according to claim 2 is characterized by the ability of said accounting information setting-out means to update said accounting information one by one according to said user's demand in an accounting system of the consumable goods according to claim 1.

[0009]In an accounting system of the consumable goods according to claim 1, the invention according to claim 3 said accounting information setting-out means, It is connected to a charging center or a sales company via a wide area network, and said accounting information is updated according to an exchange of information between said charging center or said sales company.

[0010]As for said accounting information setting-out means, in an accounting system of the consumable goods according to claim 4, direct continuation of the invention according to claim 4 is carried out to said charging center or said sales company via said wide area network.

[0011]The invention according to claim 5 is characterized by said use information being an operating limit value of said consumable goods in an accounting system of the consumable goods according to claim 1.

[0012]In an accounting system of the consumable goods according to claim 5, the invention according to claim 6 said amount-used limit means, It has a calculating means which computes an amount of consumption of these consumable goods according to use of said consumable goods, and computes an usable residue of these consumable goods based on an amount of consumption of this computed consumable goods, and an operating limit value of said consumable goods, and the amount of said user used is restricted based on an usable residue of this computed consumable goods.

[0013]In the invention according to claim 7, in an accounting system of the consumable goods according to claim 6, said calculating means computes an usable residue of these consumable goods, whenever said consumable goods are used.

[0014]The invention according to claim 8 is provided with a displaying means which displays at least one or more of use information on said consumable goods, an amount of consumption of said consumable goods, and usable residues of said consumable goods in an accounting system of the consumable goods according to claim 6.

[0015]The invention according to claim 9 is [this invention] characterized by that an accounting system of the consumable goods according to claim 6 comprises the following. An estimation means which presumes whether a shortage of a residue of these consumable goods occurs based on an usable residue of said consumable goods when performing image formation by said image forming device.

An informing means which reports a shortage of a residue of said consumable goods to said charging center or a sales company when it is presumed that it is connected to a charging center or a sales company via a wide area network, and a shortage of a residue of said consumable goods occurs.

[0016]In an accounting system of the consumable goods according to claim 9, in said charging center, the invention according to claim 10 directs a supplement of said consumable goods to said sales company, if shortage of said consumable goods is reported by said informing means.

[0017]When the invention according to claim 11 is purchased in an accounting system of the consumable goods according to claim 1 as for more than the number of times predetermined in said consumable goods, a premium is given to the purchase of next consumable goods.

[0018]When said consumable goods become used and the inventions according to claim 12 are collected by predetermined contractor in an accounting system of the consumable goods according to claim 1, a premium is given to the purchase of next consumable goods.

[0019]The invention according to claim 13 is characterized by said premium being what carries out specified proportion discount of the charge amount to said consumable goods in an accounting system of the consumable goods according to claim 11 or 12.

[0020]In an accounting system of the consumable goods according to claim 11 or 12, said use information is an operating limit value of said consumable goods, and the invention according to claim 14 is characterized by said premium being what carries out the increase in specified proportion of the operating limit value of consumable goods to charge amount.

[0021]In an accounting system of the consumable goods according to claim 11 or 12, the invention according to claim 15 will be provided with a means to manage a this given premium, if said premium is given.

[0022]The invention according to claim 16 is characterized by said consumable goods being cartridges in an accounting system of the consumable goods according to claim 1.

[0023]The invention according to claim 17 is rented in an accounting system of the consumable goods according to claim 1 with a rent predetermined [a sales company to] in said image forming device.

[0024]As for the invention according to claim 18, in an accounting system of the consumable goods according to claim 1, said accounting information setting-out means, said use

information setting means, and said amount-used limit means are carried in said image forming device.

[0025]This invention is [the invention according to claim 19] characterized by that a charging method of consumable goods used with an image forming device comprises the following.

An accounting information setting step which sets up accounting information of said consumable goods according to the amount of money paid by user.

A use information setting step which sets up use information which changes with said user's use.

The amount-used restriction step which restricts the amount of said user used based on said set-up accounting information and said set-up use information.

[0026]An accounting information setting step which the invention according to claim 20 is a program for building an accounting system of consumable goods used with an image forming device, and sets up accounting information of said consumable goods according to the amount of money paid by user, A use information setting step which sets up use information which changes with said user's use, and the amount-used restriction step which restricts the amount of said user used based on said set-up accounting information and said set-up use information are performed by computer.

[0027]

[Embodiment of the Invention]Hereafter, it explains, referring to Drawings for an embodiment of the invention.

[0028]Drawing 1 is a block diagram showing the composition of the accounting system concerning a 1st embodiment of this invention. In this embodiment, although the accounting system of the cartridge of the printer of an electrophotographying system is explained, it may apply to the accounting system of the consumable goods used by the copying machine, a facsimile, or apparatus. Here, the cartridge of the printer of an electrophotographying system shall mean the cartridge which stored the toner at least.

[0029]The computer of the user 1007 who belongs to the local network which can connect with the printer 1004 (printer which the user 1008 uses) or wide area network by which direct continuation was carried out to the wide area network as an accounting system is shown in drawing 1 (hereafter) it is called PC -- it comprises the printer 1004 connected with 1003, the cartridge fee collection center 1001 charged to use of the cartridge 1006 carried in each printer 1004, and the sales company 1002 which performs supplement of the cartridge 1006, and recovery. The nonvolatile memory 1005 which can be written is formed in the cartridge 1006.

[0030]The user 1007-1008 can receive loan service of the printer 1004 and the cartridge 1006 only at the administretive expense by the sales company 1002. By this service, the user 1007-1008 can use the printer 1004 by the payment of only administrative expense.

[0031]Next, the user 1007-1008 connects the printer 1004 to a wide area network indirectly via direct or PC1003, accesses to the cartridge fee collection center 1001, and pays in the fee according to use schedule number of sheets. The cartridge fee collection center 1001 accesses the user's 1007-1008 printer 1004 connected to the wide area network directly or indirectly, collects the use information in the memory 1005 of the cartridge 1006, and accounting information, and updates accounting information according to the paid-in fee. If the print request from the user 1007-1008 occurs, the printer 1004 will acquire the use information in the memory 1005, and accounting information, and will print in the available range. The printer 1004 reflects the use information in the memory 1005 in the cartridge 1006 after printing. One by one, the printer 1004 supervises the amount of consumption of consumable goods, and calculates the usable residue of consumable goods based on this amount of consumption and use information. The use information on the usable residue of consumable goods and consumable goods, accounting information, etc. can be displayed on the LCD panel of a printer, the monitor of PC1003, etc., corresponding to the user's 1007-1008 demand.

[0032]Next, it explains, referring to drawing 2 for the procedure of the user 1007-1008 at the time of using the printer 1004. Drawing 2 is a flow chart which shows the procedure at the time of the user in the accounting system of the consumable goods of drawing 1 using a printer.

[0033]First, as shown in drawing 2, the cartridge 1006 is supplied (Step S1) and the supplied cartridge 1006 is set to the printer 1004 by the user 1007-1008 (Step S2).

[0034]When the user 1007-1008 uses a printer, it connects with (Step S3) and the cartridge fee collection center 1001 (step S4), and payment of the fee according to schedule use number of sheets is made (Step S5). The cartridge 1006 becomes available [the printer 1004] available by this (Step S6), and the user 1007-1008 prints (Step S7).

[0035]Next, it explains, referring to drawing 3 for the control procedure in the printer 1004. Drawing 3 is a flow chart which shows the control procedure of the printer 1004 of drawing 1.

[0036]When a power supply is supplied to the printer 1004, as it is shown in drawing 3, the printer 1004 will be in the state waiting for a command, and if a command is received, it will be judged here whether the received command is a printing instruction (Step S11). The contents of the memory 1005 of the cartridge 1006 are read as the received command is a printing instruction (Step S12).

[0037]Subsequently, it is judged whether use of the consumable goods to the user's 1007-1008 payment fee exceeds a use limit by execution of the print by this printing instruction (Step S13). When not exceeding a use limit, printing is performed (Step S14) and the information update in the memory 1005 of the cartridge 1006 is performed according to the contents of execution (Step S15). When a printing instruction which exceeds a payment fee wins popularity, the user 1007-1008 is notified of insufficient funds (Step S16).

[0038]When the received command is not a printing instruction (Step S11), it is judged whether

the command concerned is needed information with the cartridge fee collection center 1001 (Step S17). Here, the contents of the memory 1005 of the cartridge 1006 are read as the received command is needed information with the cartridge fee collection center 1001 (Step S18), and communication with the cartridge fee collection center 1001 is performed (Step S19). And according to the above-mentioned communication content, the contents in the memory 1005 of the cartridge 1006 are updated (Step S20).

[0039]It is judged whether in above neither of the cases, it is generated by the power supply OFF command after that (Step S21). Here, if generated by the power supply OFF command, a power supply will be turned off (Step S20) and this processing will be ended. On the other hand, if not generated by the power supply OFF command, it returns to the above-mentioned step S11.

[0040]Next, it explains, referring to drawing 4 thru/or drawing 7 for read-out/writing control to the memory 1005 of the cartridge 1006 in the printer 1004. The block diagram showing the composition whose drawing 4 performs read-out/writing control to the memory 1005 of the cartridge 1006 in the printer of drawing 1, The block diagram showing the composition of a strange demodulation section [in / in drawing 5 / the control section of drawing 4], the block diagram in which drawing 6 shows the composition of the memory of drawing 4, and drawing 7 are the figures showing the data structure stored in the memory of drawing 4.

[0041]In the printer 1004, the cartridge 1006 of each color (magenta, yellow, cyanogen, black) is carried. As shown in drawing 4, the memory 1005 is carried in each cartridge 1006, respectively. The control section 51 which controls the whole device is formed in the printer 1004. It has CPU50 and the strange demodulation section 52, and the control section 51 can be communicated by wireless to each memory 1005. After a signal first corresponding by CPU50 is changed into a serial signal from the control section 51 about the signal outputted to each memory 1005, it becomes irregular by the strange demodulation section 52, and is transmitted to each memory 1005 via the antenna 2. The signal from each memory 1005 is received via the antenna 2, and this input signal is inputted into CPU50 after getting over by the strange demodulation section 52.

[0042]The strange demodulation section 52 has the parallel serial converter (henceforth a P-S converter) 213, the ASK section 214, the waveform shaping section 218, and the demodulation section 219, as shown in drawing 5.

[0043]CPU50 sends out each signal of the clock signal (henceforth "a SCK signal") 221, the data out signal (henceforth "DO") 222, and the signal (henceforth "RFON") 220 that directs dispatch of the electromagnetic waves which control the memory 1005 to the P-S converter 213 of the strange demodulation section 52.

[0044]The P-S converter 213 adds a start-stop signal (ST), i.e., a start bit, and a stop bit (SP) to the output signal from CPU50, and changes this output signal into the serial signal 231. This

serial signal 231 is inputted into the ASK section 214. The ASK section 214 comprises the oscillation part 215 (oscillating frequency: f1kHz) and the analog switch part 216 which oscillate the sine wave called a predetermined subcarrier (or career), Amplitude modulation (ASK:Amplitude Shift Keying) is performed to the inputted signal, and the digital-amplitude-modulation signal (henceforth an ASK signal) 212 is outputted. This ASK signal 212 is transmitted via the antenna 2.

[0045]The demodulation section 219 restores to the signal (signal transmitted from each memory 1005) received with the antenna 2. After being orthopedically operated by the waveform shaping section 218 and changing into a digital signal this signal to which it restored, it is inputted into CPU50 as the DI signal 223.

[0046]Each memory 1005 has the receiver coil 235 as an electromagnetic wave reception means which receives the ASK signal 212 sent out from the antenna 2 by electromagnetic induction, as shown in drawing 6. The signal received with this receiver coil 235 is sent to the demodulation section 237 and the power source generation part 242. Here, the receiver coil 235 and the capacitor 236 collaborate mutually, and constitute a resonant circuit, and the role which sends out only the electromagnetic waves (in this case, f1kHz) of predetermined frequency to the demodulation section 237 and the power source generation part 242 is played.

[0047]The power source generation part 242 comprises a rectification circuit and a clamp circuit for not becoming more than +3V, is, rectifies the volts alternating current generated by exciting the receiver coil 235 by the ASK signal 212, and generates the power supply of +3V. The demodulation section 237 restores to the ASK signal 212, and changes into the digital signal 250 the signal 249 to which it restored by the waveform shaping section 238. And this digital signal 250 is the S-P converter 239 of the next step, and generates the SCK signal 259 and the DI signal 260 (inputted into data-input-pins DI from EEPROM240) from the serial signal containing a start bit and a stop bit. This DI signal 260 is written in EEPROM240.

[0048]EEPROM240 sends out the signal 261 from data output pin DO in the case of mode reading. This output signal 261 is inputted into the ASK section 244 as the signal 255 through the S-P converter 239 and the P-S converter 254. The ASK section 244 comprises the oscillation part 245 and the analog switch part 246, and changes the inputted signal 255 into the signal 256 by which ASK modulation was carried out. Here, as oscillating frequency (f2kHz) of the oscillation part 245 of the ASK section 244, different things from the frequency (f1kHz) of the oscillation part 215 of the strange demodulation section 52 are used. The signal 256 by which ASK modulation was carried out is transmitted from the receiver coil 235.

[0049]An example of the stored information of the memory 1005 carried in the cartridge 1006 is shown in drawing 7. . It is the information for judging the cartridge identification code 2000 for specifying a toner cartridge as the memory 1005, the serial number 2001, the date of

manufacture 2002, the recycling frequency 2003 of a cartridge, and the life of a cartridge. The total print number of sheets 2004 using this cartridge, the total number of sheets printed 2005 by the customer by the present, and the fee 2006 that the customer paid in by the present are written in. Here, the cartridge identification code 2000, the serial number 2001, the date of manufacture 2002, and the recycling frequency 2003 of a cartridge are read-only information. On the other hand, the total print number of sheets 2004, the total number of sheets printed 2005 by the customer by the present, and the fee 2006 that the customer paid in by the present are information in which read-out/writing is possible, and is updated for every print one by one.

[0050]Thus, in this embodiment, a user can make payment of the utilization charge of the consumable goods (cartridge 1006) according to utilization quantity through a wide area network, and can lose the useless expenses concerning the purchase of consumable goods (cartridge 1006).

[0051]It explains referring to drawing 8 and drawing 9 for (a 2nd embodiment), next a 2nd embodiment of this invention. The figure and drawing 9 in which the outline of the flow of the cartridge in the accounting system of the consumable goods which drawing 8 requires for a 2nd embodiment of this invention, a user's use information, accounting information, and a usage fee is shown are a flowchart in which the procedure of the cartridge recovery by cooperation of a cartridge fee collection center and a sales company is shown. In this embodiment, the same number is attached about the same function as a 1st embodiment, and the explanation is omitted.

[0052]The printer 1004 which the user 1007 uses predicts whether it is the no which the shortage of a toner in the cartridge 1006 generates based on the use information on the cartridge 1006, and the accounting information to the user 1007, as shown in drawing 8. Here, if it is predicted that the shortage of a toner in the cartridge 1006 occurs, toner insufficient information will be reported to the cartridge fee collection center 1001. If the cartridge fee collection center 1001 receives the toner insufficient information from the printer 1004, this toner insufficient information will be reported to the sales company 1002, and the sales company 1002 will send the new cartridge 1006 to the user's 1007 origin. In that case, the sales company 1002 notifies a cartridge change to the cartridge fee collection center 1001. Thereby, the cartridge fee collection center 1001 becomes possible [writing the user's 1007 use information, and accounting information in the new cartridge 1006]. When the new cartridge 1006 is sent to the user's 1007 origin, the employee of the sales company 1002 can recover the cartridge [exhausting] 1006 certainly, and recycling of a cartridge can be promoted.

[0053]Next, it explains, referring to drawing 9 for a series of procedures for exchanging this cartridge.

[0054]If communication occurs between the user's 1007 printers 1004 as the cartridge fee collection center 1001 is shown in drawing 9 (Step S30), it will be judged whether this communication received toner insufficient information (Step S31). Here, this processing is ended when not having received toner insufficient information. On the other hand, when toner insufficient information is received, it reports that the toners of the user's 1007 printer 1004 are insufficient to the sales company 1002 (Step S32). And the sales company 1002 sends the new cartridge 1006 to the user 1007 by the above-mentioned information (Step S33). In this case, the sales company 1002 exchanges the exhausted cartridge 1006 for the new cartridge 1006, and collects the exhausted cartridges 1006 (Step S34). The sales company 1002 notifies that to the cartridge fee collection center 1001 after the end of exchange of the cartridge 1006 (Step S35). The accounting information and the use information that it corresponds with exchange of the cartridge 1006 are transmitted to the printer 1004 via a wide area network, and the cartridge fee collection center 1001 writes them in the memory 1005 of the new cartridge 1006 (Step S36). And this processing is ended.

[0055]Thus, since the cartridge fee collection center 1001 and the sales company 1002 cooperate and cartridges are exchanged when the shortage of a toner in the cartridge 1006 occurs, Recovery of the cartridge 1006 can be ensured and promotion of recycling of a cartridge can be aimed at.

[0056]It explains referring to drawing 10 for (a 3rd embodiment), next a 3rd embodiment of this invention. Drawing 10 is a figure showing the outline of the flow of the premium grant in the accounting system of the consumable goods concerning a 3rd embodiment of this invention.

[0057]In order that a user may pay a fee, when the printer 1006 of the user concerned communicates with the cartridge fee collection center 1001, the cartridge fee collection center 1001 distinguishes a user's utilization quantity to the cartridge 1006. And when it is over predetermined utilization quantity with a user's utilization quantity, a premium is given to a user's cartridge 1006. It can consider making that by which a predetermined amount of money is discounted, and the rate of the utilization quantity of consumable goods of as opposed to [pay and] a fee increase to the premium etc.

[0058]Also when these premiums exchange the cartridge 1006, operation of the sales company 1002 shall take them over. By doing so, a user comes to desire positive recovery and taking over by the sales company 1002, and can aim at recovery of the positive cartridge 1006 for recycling.

[0059]As a storage for supplying the program code of the software which realizes the function of each above-mentioned embodiment, For example, a floppy (registered trademark) disk, a hard disk, an optical disc, a magneto-optical disc, CD-ROM, CD-R, magnetic tape, a nonvolatile memory card, ROM, etc. can be used.

[0060]By executing the program code which the computer read, A part or all of processing that

OS (operating system) etc. which the function of an embodiment mentioned above is not only realized, but are working on a computer based on directions of the program code are actual is performed, and it may be made to realize the function of an embodiment mentioned above by the processing.

[0061]After the program code read from the storage was written in the memory with which the function expansion unit connected to the expansion board inserted in the computer or the computer is equipped, Based on directions of the program code, a part or all of processing that CPU etc. with which the expansion board and function expansion unit are equipped are actual is performed, and it may be made to realize the function of an embodiment mentioned above by the processing.

[0062]

[Effect of the Invention]According to this invention, the accounting information of consumable goods is set up according to the amount of money paid by the user to have explained above, Since the use information which changes with a user's use is set up and the amount of the user used is restricted based on the accounting information and the set-up use information which were set up, a user can make payment of the utilization charge of the consumable goods according to utilization quantity, and can lose the useless expenses concerning the purchase of consumable goods.

[0063]Speeding up of fee collection and increase in efficiency can be attained by using a wide area network. Recovery of consumable goods becomes certain and efficient recycling is attained.

[Translation done.]